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(12) UK Patent Application (19) GB (11) 2 296 938 (13) A

(43) Date of A Publication 17.07.1996

(21) Application No 9600569.9

(22) Date of Filing 11.01.1996

(30) Priority Data

(31) 08371831

(32) 12.01.1995

(33) US

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(51) INT CL⁶

E05C 3/12

(52) UK CL (Edition O)

E2A ACAQ A106 A162 A164 A171 A195 A197 A401
A420 A510 A516

(56) Documents Cited

GB 1399058 A

(58) Field of Search

UK CL (Edition O) E2A ACAQ

INT CL⁶ E05C 3/12 3/30 19/00 19/02 19/04 19/10

(54) Self-tightening side lock for a roll-up door

(57) A self-tightening side lock 20 for a roll-up door comprises a keeper 25 mounted on the jamb or door, and a latch 26 pivotally mounted on the door or jamb, an arcuate upper cam surface 34 of the latch 26 engaging a catch 30 on the keeper 25 to hold the door in a self-tightening closed position. A concave notch 50 extends radially into the upper cam surface 34 and receives the catch 30 to prevent further pivotal movement of the latch 26 and bowing of the jamb, and thus thwarts efforts to force the door upwards. The latch 26 has a side cam surface 33 arranged to engage the catch 30 when the door is lowered and to cause the latch 26 to pivot in a clockwise direction allow the latch 26 to pass by the catch 30. The upper cam surface 34 is arranged to engage the catch such that the anti-clockwise movement of the latch 26 will cause the door to be self-tightening.

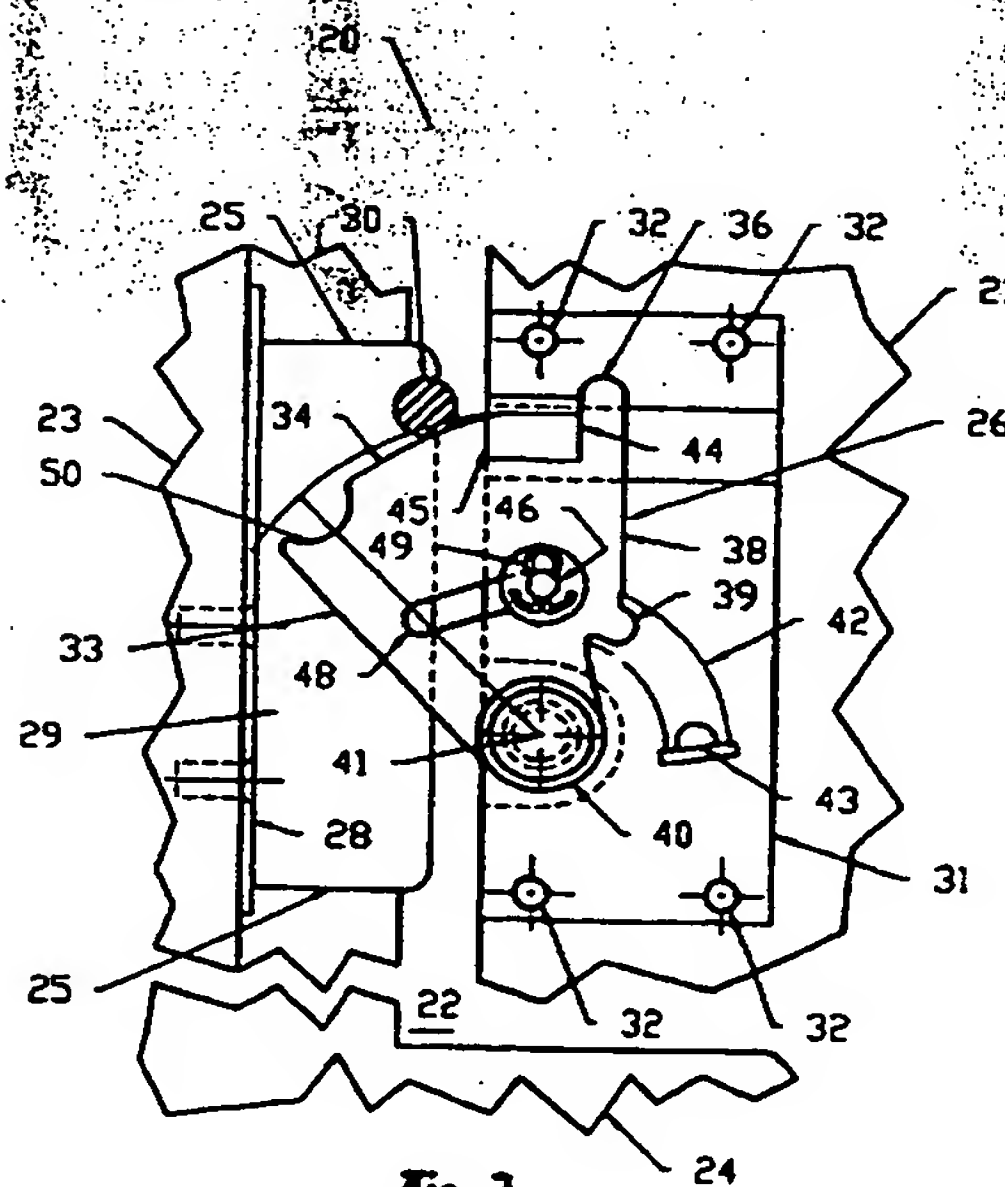


Fig. 2

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In an attempt to solve this problem, it has been proposed to use a hook-like member as a substitute for the butterfly-type latch member, and to use an improved keeper having a catch that would be selectively received in the concavity provided in the hook member. Thus, if an intruder attempt to "jimmy" the door, the catch member would be more firmly received in the crotch of the hook. This type of mechanism is shown in applicant's prior U.S. Patent No. 5,022,691, the aggregate disclosure of which is hereby incorporated by reference. While this arrangement is structurally sound, it is somewhat expensive in that the parts are generally heavier and more substantial than those in the prior art. In addition, it has been found that the hook member and the keeper must be accurately positioned on the door and jamb, respectively. Another disadvantage is that, in some cases, the self-tightening feature is lost, and the door may "dance" upwardly and downwardly as the vehicle moves down the street.

Accordingly, it would be generally desirable to provide an improved butterfly-type latch member that could be used with such a catch-containing keeper, that would be inexpensive to manufacture, but that would effectively prevent an intruder from attempting to defeat the lock.

With this in mind, according to the invention there is provided a

self-tightening side lock for a roll-up door adapted to selectively close an opening bounded by a jamb and a sill comprising:

a keeper mounted on one of said jamb and door, said keeper having a catch arranged in spaced relation to said jamb and sill; and

a latch member pivotally mounted on the other of said jamb and door and selectively cooperable with said catch to hold said door in a closed position with respect to said opening, said latch member being biased to move in one angular direction relative to the other of said jamb and door, said latch member being adapted to be moved in the other angular direction relative to the other of said jamb and door to an out-of-the-way position at which said displaced latch may pass by said catch, said latch member having a side cam surface arranged to engage said catch when said door is lowered and to cause said latch member to pivot in said other angular direction toward said out-of-the-way position to allow said latch member to pass by said catch, said latch member also having an upper cam surface arranged to engage said catch such that movement of said latch member in said one angular direction will cause said door to be self-tightening, and wherein a notch extends into said latch member from said upper cam surface adjacent said side cam surface, said notch being so configured and arranged as to receive said catch and to prevent further pivotal movement of said latch member relative to said door;

thereby to thwart the efforts of a would-be thief who might attempt to force said door upwardly when said cam surface engages said catch.

One embodiment of the side lock in accordance with the invention will now be described by way of example only, with reference to the accompanying drawings, in which:-

Figure 1 is a fragmentary view, partly in elevation and partly in cross-section, showing the latch member of the side lock mechanism as being mounted on a door to engage a catch provided on a jamb-mounted keeper, this view showing the side cam surface of the latch member as engaging the catch when the door is lowered;

Figure 2 is a view similar to that of Figure 1, but showing the latch member as having passed beneath the catch, and as having been rotated in a counter-clockwise direction from the position shown in Figure 1 such that the upper cam surface of the latch member engages the catch; and,

Figure 3 is a view similar to Figure 2, showing the latch member as having been rotated in a clockwise direction from the position shown in Figure 2, and the catch as being received in the latch member notch to defeat the attempt of a thief to forcibly open the door.

At the outset, it should be clearly understood that like reference numerals are intended to identify the same structural elements, portions or surfaces consistently throughout the several drawings figures, as such elements, portions or surfaces may be further described or explained by the entire written specification, of which this detailed

description is an integral part. Unless otherwise indicated, the drawings are intended to be read (e.g., cross-hatching, arrangement of parts, proportion, degree, etc.) together with the specification, and are to be considered a portion of the entire written description of this invention. As used in the following description, the terms "horizontal", "vertical", "left", "right", "up" and "down", as well as adjectival and adverbial derivatives thereof (e.g., "horizontally", "rightwardly", "upwardly", etc.), simply refer to the orientation of the illustrated structure as the particular drawing figure faces the reader. Similarly, the terms "inwardly" and "outwardly" generally refer to the orientation of a surface relative to its axis of elongation, or axis of rotation, as appropriate.

Referring now to the drawings, and more particularly to Fig. 1 thereof, the present invention broadly provides an improved self-tightening side lock mechanism, generally indicated at 20, for a roll-up door, a fragmentary portion of which is indicated at 21. This door is adapted to selectively close an opening 22 partially bounded by a left side jamb 23 and a lower sill 24. The improved mechanism broadly includes a keeper, generally indicated at 25, mounted on the jamb, and a latch member generally indicated at 26, mounted on the door. While the keeper is shown as being mounted on the jamb and the latch member is shown as being mounted on the door, the positions of these two members could possibly be reversed in some instances.

The keeper 25 is substantially shown in the aforesaid U.S. Patent No. 5,022,691. This keeper includes a vertically-elongated plate 28 secured to the jamb, and a plurality of vertically-elongated plate-like members, one of which is indicated 29, extending perpendicularly therefrom toward the door. A cylindrical catch 30 is operatively mounted on the two plates 28, 29 in spaced relation to the side jamb 23 and to the lower sill 24.

In the preferred embodiment, latch member 26 is shown as being pivotally mounted on a vertically-elongated plate-like member 31. Plate 31 has four mounting holes, severally indicated at 32, which are adapted to receive passage of the shank portions of a corresponding plurality of fasteners (not shown), such as bolts or the like, by means of which the plate may be mounted on the door. The improved latch member is shown as being the generally of the butterfly-type shape, and has a substantially-planar side cam surface 33, a convex or rounded upper cam surface 34, a substantially-planar surface 35 extending generally tangentially from the right margin of surface 34, a rounded lug portion 36 extending upwardly from surface 35, a right side surface 38, a tongue 39, and a convex or a rounded portion 40 generated about the pivotal axis 41 and tangentially joining the lower margin of side cam surface 33. A coil spring 42 has its left marginal end portion encircling tongue 39, and acts between the latch member and a

similar tab 43 struck outwardly from the plate 31. Spring 42 serves to bias the latch member to move in a counter-clockwise direction until the left surface of lug 36 engages the stop surface 44 of another tab 45 struck outwardly from the plate. A pin 46 mounted on the latch member is constrained to move within a slot 48 provided in the plate. A cotter pin 49 prevents the unintended separation of pin 46 from the slot. A suitable actuation mechanism (not shown) may be operatively arranged to move the latch member to an out-of-the-way position in order that the door might be raised. Upper cam surface 34 is not generated about pivotal axis 41.

When the door is lowered, side cam surface 33 will engage catch 30 and pivot the latch member in a clockwise direction by overcoming the opposing bias provided by spring 42, as shown in Fig. 1. Once the door has been sufficiently lowered, spring 42 will urge the latch member to pivot in a counter-clockwise direction to the position shown in Fig. 2. In this position, catch 30 will engage upper cam surface 34. Thus, if the door attempts move further downwardly relative to the catch, spring 42 will urge the latch member to pivot further in a counter-clockwise direction such that catch 30 will move further up cam 34. Thus, the door is self-tightening.

In the preferred embodiment, a notch, generally indicated at 50, is shown as extending radially into the latch member from upper cam surface 34, at a position adjacent side cam surface 33. In the preferred embodiment, this notch 50 is simply a concave recess. However, if a thief attempts to place a crowbar under the door, and attempts to pry the door upwardly, it is possible for cam surface 34 to pivot in a clockwise direction, overcoming the opposing bias of spring 42, toward an out-of-the-way position. However, just before the cam surface might reach this position, the catch will be received in notch 50, as shown in Fig. 3. This will prevent further pivotal motion of the latch member in either lateral direction. Hence, the attempts of the thief will have been defeated.

The present invention contemplates many changes and modifications may be made. For example, the catch may have shapes in forms other than that specifically shown. Similarly, the keeper maybe of other shapes and configurations as well. The latch member need not be configured as the so-called butterfly-type, but may have other shapes or forms as well. In the preferred embodiment, the notch is shown as being concave. However, in other forms, it might have other shapes and configurations as well. For example, it might be U-shaped, V-shaped, or the like. Also, it is preferable that the notch be provided immediately adjacent side cam surface 33 because upper cam surface 34 is not generated about latch member axis 41. This is clearly indicated by the radius in Figs. 1-3 that is generated about pivotal axis 41. Hence, the presence of the

notch in the upper cams surface does not interfere with the normal engagement and disengagement of the side lock mechanism.. However, this is not invariable, and maybe changed.

Therefore, while the presently-preferred form of the improved self-tightening side lock mechanism as been shown and described, and several modifications thereof discussed, persons skilled in this art will readily appreciate the various additional changes and modifications maybe made without departing from the scope of the invention, as defined and differentiated in the following claims.

Claims

1. A self-tightening side lock for a roll-up door adapted to selectively close an opening bounded by a jamb and a sill comprising:
 a keeper mounted on one of said jamb and door, said keeper having a catch arranged in spaced relation to said jamb and sill; and
 a latch member pivotally mounted on the other of said jamb and door and selectively cooperable with said catch to hold said door in a closed position with respect to said opening, said latch member being biased to move in one angular direction relative to the other of said jamb and door, said latch member being adapted to be moved in the other angular direction relative to the other of said jamb and door to an out-of-the-way position at which said displaced latch may pass by said catch, said latch member having a side cam surface arranged to engage said catch when said door is lowered and to cause said latch member to pivot in said other angular direction toward said out-of-the-way position to allow said latch member to pass by said catch, said latch member also having an upper cam surface arranged to engage said catch such that movement of said latch member in said one angular direction will cause said door to be self-tightening, and wherein a notch extends into said latch member from said upper cam surface adjacent said side cam surface, said notch being so configured and arranged as to receive said catch and to prevent further pivotal movement of said latch member relative to said door;
 thereby to thwart the efforts of a would-be thief who might attempt to force said door upwardly when said cam surface engages said catch.
2. A self-tightening side lock as set forth in claim 1 wherein said keeper is mounted on said jamb and said latch member is mounted said door.
3. A self-tightening side lock as set forth in claim 1, and further comprising a spring acting between said latch member and said other of said jamb and door for biasing said latch member to move in said one angular direction.

4. A self-tightening side lock as set forth in claim wherein said side cam surface is substantially planar.
5. A self-tightening side lock as set forth in claim 1 wherein said upper cam surface is arcuate.
6. A self-tightening side lock as set forth in claim 5 wherein said upper cam surface is configured as a convex circular segment generated about an axis not coincident with the pivotal axis of the latch member.
7. A self-tightening side lock as set forth in claim 1 wherein said notch is concave.
8. A self-tightening side lock as set forth in claim 1 wherein said notch extends generally radially into said latch member.
9. A self-tightening side lock as set forth in claim 1, substantially as described with reference to the accompanying drawings.

Amendments to the claims have been filed as follows

a

CLAIMS

1. A self-tightening side lock for a roll-up door arranged to selectively close an opening bounded by a jamb and a sill comprising:

a keeper mounted on one of said jamb and door, said keeper having a catch arranged in spaced relation to said jamb and sill; and

a latch member pivotally mounted on the other of said jamb and door and selectively cooperable with said catch to hold said door in a closed position with respect to said opening, said latch member being biased to move in one angular direction relative to said jamb and door and being movable in the opposite angular direction to an out-of-the-way position at which the so displaced latch member may pass by said catch, said latch member having a side cam surface arranged to engage said catch when said door is lowered and to cause said latch member to pivot in said opposite angular direction toward said out-of-the-way position to allow said latch member to pass by said catch, said latch member also having an upper cam surface arranged to engage said catch such that movement of said latch member in said one angular direction will cause said door to be self-tightening, and wherein a notch extends into said latch member from said upper cam surface adjacent said side cam surface, said notch being so configured and arranged as to receive said catch and to prevent further pivotal movement of said latch member relative to said door;

thereby to thwart the efforts of a would-be thief who might attempt to force said door upwardly when said upper cam surface engages said catch.

2. A self-tightening side lock as set forth in claim 1 wherein said keeper is mounted on said jamb and said latch member is mounted on said door.

3. A self-tightening side lock as set forth in claim 1, and further comprising a spring acting between said latch member and said other of said jamb and door for biasing said latch member to move in said one angular direction.



Application No: GB 9600569.9
Claims searched: 1-9

Examiner: Richard Nicholls
Date of search: 28 March 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): E2A (ACAO)

Int Cl (Ed.6): E05C 3/12, 3/30, 19/00, 19/02, 19/04, 19/10

Other: None

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 1399058 A (OVERTON) see figures 1 and 2	1

X Document indicating lack of novelty or inventive step
Y Document indicating lack of inventive step if combined with one or more other documents of same category.
& Member of the same patent family

A Document indicating technological background and/or state of the art.
P Document published on or after the declared priority date but before the filing date of this invention.
E Patent document published on or after, but with priority date earlier than, the filing date of this application.